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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/599,434	09/28/2006	Manfred T. Reetz	100716-66 KGB	8789

27384 7590 06/29/2010

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EXAMINER	
EMPIE, NATHAN H	
ART UNIT	PAPER NUMBER
1712	
MAIL DATE	DELIVERY MODE
06/29/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/599,434	REETZ ET AL.	
	Examiner	Art Unit	
	NATHAN H. EMPIE	1712	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 April 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-8 and 10-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 3-8, and 10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Examiner acknowledges receipt of 4/28/10 amendment to the claims which was entered into the file. Claims 1, 3-8, and 10-18 are currently pending.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 3- 8, 10-11 and 13-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beer (US patent 3,711,385; as provided in Applicant's IDS of 9/28/06, hereafter Beer) in view of Ioroi et al ("Iridium Oxide / Platinum Electrocatalysts for Unitized Regenerative Polymer Electrolyte Fuel Cells" J. Electrochem. Soc. 147 (6) (2000) pg 2018-2022; hereafter Ioroi) and Applicant's Admitted Prior Art (AAPA), optionally, further in view of Bestaoui et al ("A Chimie Douce Route to Pure Iridium Oxide" Chem. Mater. 1997 9. pg 1036-1041; hereafter Bestaoui).

Claim 18: Beer teaches a process comprising preparing colloidal iridium oxide (see, for example, abstract, col 2 lines 20 – 42, and col 11 lines 50 – 65) by a process comprising;

forming an aqueous solution of an Ir salt and admixing with a Bronsted base (NaOH) to produce a mixture, and coating a colloidal iridium oxide, and other platinum group oxides onto a surface (see, for example, col 2 lines 20 – 42, col 7 lines 25 – 42, and col 11 lines 50 – 65). Beer is silent as to the specific reaction conditions, so Beer

does not explicitly teach adjusting the pH to >12 or stirring the mixture at a temperature from 0 to 100°C over a period of from 3 to 72 hours. Ioroi teaches a method of forming iridium oxide from the reactants comprising an iridium salt, water, and NaOH (see, for example, abstract, and pg 2018-2020). Ioroi teaches that the iridium oxide can predictably be synthesized by stirring the reactants at a temperature of 40°C for several hours (see, for example, pg 2018). As both Beer and Ioroi teach methods for forming colloidal iridium oxide from precursors comprising, an iridium salt, water, and NaOH, it would have been obvious to one of ordinary skill in the art at the time of invention to have incorporated the reaction conditions taught by Ioroi into Beer in order to achieve the predictable result of forming iridium oxide and when a primary reference is silent as to a certain detail, one of ordinary skill would be motivated to consult a secondary reference which satisfies the deficiencies of the primary reference. Although Beer in view of Ioroi doesn't explicitly teach holding at temperature of from 3 to 72 hours, the examiner asserts that a teaching of "several hours" at the very least would overlap this claimed range, so it would have been obvious to one of ordinary skill in the art at the time of invention to have incorporated a period within the claimed range since in the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976). Ioroi further teaches that the pH of the solution is lowered to ~8 following the continuous stirring (see, for example, pg 2018), so the pH of this solution was therefore higher than 8 during mixing / stirring. Although a pH of greater than 8 is not explicitly > 12, it would have been obvious to one of ordinary skill in the art at the time of

invention to have incorporated a pH within the claimed range since in the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976).

Claim 18 (optionally further in view of Bestaoui) - Beer in view Ioroi teach a pH of greater than 8, but they are silent as to what the pH was originally adjusted to, so neither Beer nor Ioroi explicitly teach that the pH is adjusted to >12. Bestaoui teaches a method of forming colloidal iridium oxide from the reactants comprising an iridium salt, water, and an alkali metal hydroxide (see, for example, abstract, and pg 1037-1040). Bestaoui further teaches wherein the pH of the salt / water / hydroxide solution is adjusted to about 12 (see, for example, pg 1039). And Bestaoui further teaches that pH is a result effective variable influencing the rate of hydrolysis (see, for example, pg 1037 - 1039, and Fig 2 and 3). As Bestaoui and Beer in view of Ioroi teach methods for forming colloidal iridium oxide from precursors comprising, an iridium salt, water, and alkali metal hydroxides, it would have been obvious to one of ordinary skill in the art at the time of invention to have incorporated the reaction conditions taught by Bestaoui in to the method of Beer in view of Ioroi in order to achieve the predictable result of forming iridium oxide and when a primary reference is silent as to a certain detail, one of ordinary skill would be motivated to consult a secondary reference which satisfies the deficiencies of the primary reference. Further, although the adjustment of the pH to about 12 is not explicitly >12, it would have been obvious to one of ordinary skill in the art at the time of invention to have incorporated a pH > 12 since about 12 would include slightly lower or higher than 12 and these overlap the range of >12. In the case where

the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976).

Claim 1: Beer in view of Ioroi (and Bestaoui, optionally) teach the method of claim 18 (described above) wherein Beer further teaches applying colloidal platinum group oxides (such as iridium oxide) to a surface to yield a coated surface (see, for example, col 2 lines 20 - 43, col 3 line 66 – col 4 line 17, col 7 lines 25 - 65, and col 11 lines 50 - 75). Beer further teaches drying the coated surface and firing the coated surface at a temperature of at least 460^{o}C (see, for example, col 7 lines 25 - 35). Although a temperature of at least 460^{o}C is not explicitly the claimed range of 300 to 1000^{o}C, it would have been obvious to one of ordinary skill in the art at the time of invention to have incorporated a temperature within this range since in the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976). With respect to the remaining limitation of repeating the coating operation until a desired thickness is achieved this limitation is recited as optional, so it is not required to be taught by the prior art. Further repeating a coating operation (including heating steps) is well known in the art as a predictable way to build up and better control the coating thickness applied (AAPA).

Claims 3 and 10: Beer in view of Ioroi (and Bestaoui, optionally) teach the method of claim 18 (described above) wherein Beer has further taught NaOH as the Bronsted base.

Claim 4: Beer in view of Ioroi (and Bestaoui, optionally) teach the method of claim 18 (described above, including the pH limitation) wherein Beer has further taught an aqueous solution of Ir salt is used (see, for example, col 11 lines 54 – 56).

Claim 5 and 13: Beer in view of Ioroi (and Bestaoui, optionally) teach the method of claim 18 (described above) wherein Ioroi has taught $H_2IrCl_{6-x}H_2O$ as the Ir salt. Page 2018.

Claims 6, 7, and 14: Beer in view of Ioroi (and Bestaoui, optionally) teach the method of claim 18 (described above) wherein Beer further teaches the surface being coated is a Ti electrode (See, for example, col 3 lines 1 – 19).

Claims 8 and 16: Beer in view of Ioroi (and Bestaoui, optionally) teach the method of claim 18 (described above) wherein Beer further teaches that the electric conductivity of the platinum group oxides of relatively thin layers has been found to be virtually equal to that of the corresponding metals, while providing superior chemical resistance (see, for example, col 2 lines 13 - 20). So achieving thin layers is desirable to the method of Beer. Beer is silent as to the particle size produced, so Beer in view of Ioroi (and Bestaoui, optionally) do not explicitly teach wherein the colloidal iridium oxide produced has a particle size of less than or equal to 10nm or further less than or equal to 3nm, but the examiner asserts that such claimed particle sizes would be inherent to the process taught by Beer in view of Ioroi (and Bestaoui, optionally) since the prior art have taught a method comprising the same starting materials (such as water, $H_2IrCl_{6-x}H_2O$, and NaOH), and overlapping pH's and temperatures as the claimed method. Where the claimed and prior art products are identical or substantially identical

in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of obviousness has been established, In re Best, 195 USPQ 430, 433 (CCPA 1977). Further "When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not" In re Spada, 15 USPQ2d 1655 1658 (Fed Cir. 1990). Here the sound basis for believing that the products of the applicant and the prior art are the same is the provision of the same claimed materials and process steps. Alternatively, as the particle size produced influences the level to which the layer thickness can be reduced, the particle size is a result effective variable, so it would have been obvious to one of ordinary skill in the art at the time of invention to have incorporated a particle size with the claimed ranges since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Claims 11 and 17: Beer in view of Ioroi teach the method of claims 4 and 18 (described above) wherein the combination of references have taught a pH greater than 8, (as described above in rejection of claim 18), but not explicitly greater than or equal to 13, it would have been obvious to one of ordinary skill in the art at the time of invention to have incorporated a pH > 13 or greater than or equal to 13 since in the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a *prima facie* case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976).

Claim 15: Beer in view of Ioroi (and Bestaoui, optionally) teach the method of claim 18 (described above) wherein Beer further teaches the Ti electrode is an electrode for the evolution of oxygen and chlorine (see, for example, abstract, col 1 lines 30 – 39), and col 3 lines 11 - 19).

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Beer in view of Ioroi, AAPA, and Bestaoui.

Claim 12: Beer in view of Ioroi, AAPA, and Bestaoui teach the method of claim 18 (described above) wherein Bestaoui teaches alkali metal-iridium salts such as Na_2IrCl_2 (see, for example, pg 1037).

Response to Arguments

Applicant's arguments filed 4/28/10 have been fully considered but they are not persuasive.

In response to applicant's argument that "Beer does not, in fact, teach formation of colloidal iridium oxide" and "'colloidal' means to any person skilled in the art that the particles are dissolved and that these particles cannot be separated from the solution by filtration or any other separation procedure. This solution can only be obtained by increasing the pH value to least 12". (pg 7 – 8 of remarks) the examiner asserts that according to MPEP 2111.01 III: "[T]he ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent

application." Phillips v. AWH Corp., *>415 F.3d 1303, 1313<, 75 USPQ2d 1321>, 1326< (Fed. Cir. 2005) (en banc). Sunrace Roots Enter. Co. v. SRAM Corp., 336 F.3d 1298, 1302, 67 USPQ2d 1438, 1441 (Fed. Cir. 2003); Brookhill-Wilk 1, LLC v. Intuitive Surgical, Inc., 334 F.3d 1294, 1298 67 USPQ2d 1132, 1136 (Fed. Cir. 2003). The applicant has not provided evidence to support the applicant's specific meaning of "colloidal", and the arguments of counsel cannot take the place of evidence in the record. In re Schulze, 346 F.2d 600, 602, 145 USPQ 716, 718 (CCPA 1965). The examiner directs the applicant's attention to Reed Principles of Ceramic Processing 2nd ed. pg 69-70, wherein Reed has provided that one of ordinary skill in the art for practical purposes would generally consider particles below 1 micron as colloidal. Therefore as the particles of Beer are taught to form films on the order of 0.54 microns (see, for example, col 2 and col 5), the particles making up such a film thickness would inherently be less than 0.54 microns and would be considered colloidal, additionally Ioroi has taught iridium oxide on the order of 30-50 nm (see, for example, pg 2020). Further the examiner asserts that the rejections are made over a combination of references (i.e. Beer in view of Ioroi (optionally Bestoui)) not Beer or Ioroi alone; and one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Applicant asserts that "This solution can only be obtained by increasing the pH value to least 12", and the examiner asserts that by combination of the prior art such reacting at such a pH was rendered obvious by the prior art, so as the prior art has

taught increasing the pH to at least 12, it would additionally inherently for the disputed colloidal structure. Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of obviousness has been established, In re Best, 195 USPQ 430, 433 (CCPA 1977).

As the applicant has not traversed the examiners previous assertion of official notice "that repeating a coating operation (including heating steps) is well known in the art as a predictable way to build up and better control the coating thickness applied" (refer to content rejecting claim 1 in previous office action), the well known in the art statement is taken to be admitted prior art.

As to the dependent claims, they remain rejected as no separate arguments are provided.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NATHAN H. EMPIE whose telephone number is (571)270-1886. The examiner can normally be reached on M-F, 6:45- 4:15 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on (571) 272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/N. H. E./
Examiner, Art Unit 1712

/Michael Cleveland/
Supervisory Patent Examiner, Art Unit 1712